Oxidation Resistant, Cr retaining, Conductive Coatings on Metallic Alloys for SOFC Interconnects

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SOFC Metallic Interconnects

- Promise
  - Lower operating temperatures (600-800°C) may allow inexpensive metallic alloys for SOFC interconnects
- Challenge
  - Conventional metallic alloys develop protective oxide scales during SOFC exposure, degrading performance

Arcomac’s Technical Approach

- 2-Segment Coating Concept:
  - 1st Segment: vanadium-substituted Cr-CoxOxAl2O3 (oxidation resistant diffusion barrier, bond coating)
  - 2nd Segment: outer barrier Chromium-CuCr (electrical conductivity, erosion resistance)

SOFC Interconnect Function:

SOFC Stacking

Coating Adhesion Assessment - Rockwell Indentations

Future Work

- Optimize Coating Architecture and Composition to Meet or Exceed SECA SOFC Interconnect Cost and Performance Requirements
- Expand Testing and Analyses to more Prototypical SOFC Exposure
- Assess Coating Process Scale-Up, Economics and Technology Transfer to SECA Industrial Teams